

Editors' view

Medication errors: EMERGING solutions

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C'est pire qu'un crime, c'est une faute
Charles Maurice de Talleyrand-Périgord (attributed)

The error that Talleyrand is said to have considered worse than a crime was Napoleon's order to execute the Duc d'Enghien in 1794. The saying has also been attributed to Joseph Fouché, Bonaparte's Minister of Police (later to be the Duc d'Otrante) and to Antoine Boulay de la Meurthe (a deputy in the corps legislative). But whoever said it, it betokens an attitude that the end justifies the means. And while one would not recommend breaking the law in order to avoid medication errors, one should certainly strive to avoid them as assiduously as one would refrain from committing a crime.

A Pubmed search for the terms 'medication errors' or 'prescribing errors' yields nearly 8000 hits. [In contrast 'surgical errors' yields about 100 hits – do surgeons not make errors?] And there is evidence that deaths from medication errors have been on the rise [1]. This issue of the *Journal* is completely devoted to medication errors, and contains both reviews and original articles. We note that medication errors are failures in any aspect of the treatment process (including the manufacturing or compounding, prescribing, transcribing (when relevant), dispensing, and administration of a medicinal product, and the subsequent monitoring of its effects), failures that cause, or have the potential to cause harm to the patient.

Definition and classification

If we are going to understand fully the nature of medication errors and prevent them, we must first define the terms associated with them and classify them properly [2]. The importance of careful definition becomes clear when we come to consider the difficulty in assessing the frequency of medication errors, which has been bedeviled by inconsistent definitions [3, 4]. This is highlighted by the results of a systematic review, published in this issue of

the *Journal*, of 24 studies of prescribing errors by junior doctors [5]. There were considerable variations in design, methods, and error definitions, and error rates were hugely variable: 2–514 per 1000 items prescribed and 4.2–82% of patients or charts reviewed. Until consistent definitions and methods are used we shall struggle to understand the epidemiology of medication errors and the factors that contribute to them.

As far as classification is concerned, plagued as it is by 'the vexing problem of identity within variety' [6], a psychological approach resolves the matter. This gives insight into methods of preventing errors, and indeed most of the reviews in this issue of the *Journal* comment on some aspect of prevention. However, we do not yet know the precise distribution of errors across the different aetiological categories, and this is a matter that requires urgent attention.

Causes

The business of formulating, prescribing, and administering drugs and monitoring their effects is not straightforward. Medication errors, most of which are due to prescribing faults (failures in the process of deciding which drug to use and how) and prescription errors (failures in the prescription writing process that result in wrong instructions about one or more of the normal features of a prescription) [3, 7], can arise in many ways, which deserve careful attention. Health-care professionals are more likely to make errors when they are inexperienced, inattentive, rushed, distracted, tired, or depressed; orthopaedic surgeons, the butt of many medical jokes, and nurses are more likely than other health-care professionals to make medication errors; and because errors are more likely in very young and very old patients, it is not surprising that in hospital they are more likely to occur in departments of paediatrics and intensive care units [8]. Problems in elderly people are so important that they deserve a review all to themselves [9].

Detection and prevention

The major practical methods by which health-care professionals detect medication errors and associated adverse drug-related events are chart review, computerized monitoring, administrative databases, and claims data, using direct observation, incident reporting, and patient monitoring; these methods are compared and their advantages and limitations discussed [10]. Patients, who bear the brunt of the outcomes, should also be involved in the processes of detection and prevention; communication is key [11], and all members of the health-care team should be involved.

Computerized systems can contribute to prevention as well as detection, but they are expensive and can generate their own forms of error [12]. Simpler and cheaper methods are available and should be widely implemented. For example, error reporting is important in both detection and prevention [7], and pharmacovigilance has a role to play [13]. However, chief among the preventive methods is education [14].

There is evidence that medical students feel unprepared and unskilled to prescribe when they graduate [15, 16] and that deaths from medication errors and adverse drug reactions have been on the rise [1]. Furthermore, an increasingly elderly population is being exposed to medicines that are increasingly difficult to use safely and effectively. There is therefore a pressing need for more education in the art of practical prescribing through the science of pharmacology, clinically applied (i.e. clinical pharmacology & therapeutics). This education should include the ability to take the medication history accurately [17] and to examine the patient for evidence of drug effects and investigate drug action at the bedside [18]; to plan appropriate therapy for common indications [19]; write a safe and legal prescription; appraise critically the prescribing of others; calculate appropriate dosage regimens; provide patients with appropriate information about their medicines [11]; access reliable information about medicines; and detect and report adverse drug reactions and drug interactions. Education of pharmacists should reduce the risk of dispensing errors [20]. There is evidence that of all educational methods for improving prescribing in general, the WHO Good Prescribing Guide may be the best, although the evidence, summarized in a systematic review, is sketchy [21]. Since assessment is a major driver of learning, qualification should be contingent upon success in an undergraduate prescribing examination, irrespective of success in other parts of the medical curriculum; this could be accompanied by a licence to prescribe [22]. Continuing postgraduate education of all prescribers and others involved in the medication process should also be *de rigueur*. The use of standardized prescription charts in hospitals is another potentially useful inexpensive preventive strategy [7].

Conclusions

From our beginning comes our end. The first article in this issue of the *Journal* emerged from a consensus meeting of a group that has called itself EMERGE (The Erice Medication Errors Research Group – hence the title of this paper), which produced 15 recommendations about medication errors [23]. Six of those were concerned with teaching or training.

As the total number of physicians in all medical specialties has increased in the UK during the last 15 years or so, the number of consultant clinical pharmacologists has fallen [24]. There are moves to reverse this trend [25], linked to a belated recognition that the teaching of practical prescribing is important and that clinical pharmacologists, with their expertise across the whole waterfront of clinical medicine and drug therapy [26], and their ability to demonstrate knowledge and expertise across the whole gamut of translational medicine [27], from molecules to medicine, from bench to bedside, are best placed to deliver it.

Following Talleyrand, we may consider those who perpetrate medication errors to be the Napoleons of crime. However, we must not commit the crime of allowing them to commit errors as often as they currently do.

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